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09/633,032	08/04/2000	Roger Meuwly	33383-072824.0112	2332
27799	7590	05/05/2004	EXAMINER	
COHEN, PONTANI, LIEBERMAN & PAVANE 551 FIFTH AVENUE SUITE 1210 NEW YORK, NY 10176			MUSSEY, BARBARA J	
			ART UNIT	PAPER NUMBER
			1733	

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/633,032

**Applicant(s)**

MEUWLY ET AL.

**Examiner**

Barbara J. Musser

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-49 is/are pending in the application.
- 4a) Of the above claim(s) 28-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, it is unclear what is meant by "rubber" in line 14 as dependent claims refer to the same material as sulfur vulcanizable elastomer.(claims 24-26) It is suggested "rubber" be replaced by -- sulfur vulcanizable elastomer --. In line 21, it is unclear what is meant to joining the length of precomposite to rubber as the previous step does not indicate that rubber layers are present. Line 14 only indicates the material is capable of bonding to rubber, not that rubber is actually present. It is suggested applicant either remove the reference to rubber to positively recite its presence in the previous steps.

Claims 12-14 recite the limitation "the different lengths" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 14, it is unclear what range is encompassed by the word "high" as it is a relative term, and when referring to viscosity, it is also dependent on the temperature at which it is measured.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4, 7-9, 11, and 16-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Green(U.S. Patent 4,092,443) in view of Pratt(U.S. Patent 5,145,621)

Green discloses a method of manufacturing a composite part wherein sheets of unidirectional fibers are impregnated with resin, at least partially cured using actinic radiation, shaped and stacked, and fully cured using heat.(Abstract) The reference does not specifically disclose stacking the layers in a mold prior to finally curing them. Pratt discloses it is well-known and conventional to stack layers of partially cured unidirectional fiber-reinforced material in a non-planar support and consolidating them to remove voids.(Col. 5, ll. 41-50; Col. 5, ll. 66- Col. 6, ll. 7) It would have been obvious to one of ordinary skill in the art at the time the invention was made to stack the layers on the support of Pratt prior to finally curing them since the device of Pratt would allow formation of the multi-layered shaped part of Green without voids which would reduce the strength of the final structure(Col. 6, ll. 2-8) particularly since Green discloses the sheets can be stacked and shaped, indicating they are formed into a nonplanar shape.(Abstract)

Sheets of unidirectional fibers are considered to have the fibers substantially parallel in one plane as that is the conventional description of a sheet of unidirectional fibers.

While the claims are not restricted to polymerizing using ionizing radiation only to a specific depth, it is noted that Green discloses a variety of irradiation times, indicating that some of the sheets are only partially cured.(Col. 17, ll. 18; Col. 18, ll. 53) Since these sheets are cured to at least the amount shown in applicant's examples, one in the art would appreciate that the fibers would not buckle as applicant's do not buckle. Since the sheets are only partially cured and in partial curing some of the reactive components have no reacted, one in the art would understand that those reactive components would be capable of bonding with other reactive components in adjacent sheets, and therefore polymerization would have been limited so as to permit bonding of the sheet to another sheet.

It is noted that the final products being capable of being subjected to high mechanical stress does not require the products to be capable of surviving such stress, simply that they can be exposed to it. It does not appear to limit the process or materials in any way. While the reference does not state the final products are capable of surviving high mechanical stress, they are made in the same manner as applicant's using the same materials to form the same type of products. It would naturally flow from that that the final products would both be capable of surviving the same types of stresses.

While the references do not specifically state the prepregs are fitted snugly against each other and the support, Pratt stacks the layers and consolidates them to form a laminate without gaps between the layers, indicating the layers fit snugly against each other.

Regarding claim 2, one in the art would appreciate that any type of mold could be used as a molding surface.

Regarding claims 3, 4, 8, and 9, the references do not disclose how much of the radiation-curable resin is cured, though it does indicate that different amounts can be cured.(Examples) One in the art would appreciate that the portion of the sheet closest to the radiation source would cure first and that the specific amount of curing would be within the purview of one in the art. The claimed ranges are simply methods of categorizing the percentage of resin cured, and the use of such methods to determine the amount of cure would be within the skill of one in the art.

Regarding claim 7, one in the art would appreciate that the temperature of molding/final curing would be above the glass transition temperature of the resin so that the resin would flow to form a unified structure as is desired in prepregs.

Regarding claim 11, Pratt discloses applying pressure to the stack to force out the air.(Col. 6, ll. 17-22)

Regarding claim 16, the resin can be an ester.(Col. 2, ll. 54-55)

Regarding claim 17, the resin can be an epoxy.(Col. 3, ll. 67-68)

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Regarding claims 18 and 19, the resin can contain styrene.(Col. 4, ll. 1-2) One in the art would appreciate that changing the amount of the components present in the mixture.

Regarding claim 20, Green discloses the mixture contains a photo-initiator which is polymerized using ultraviolet radiation.(Abstract; Col. 15, ll. 66)

Regarding claim 21, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use any conventional type of photo-initiator in the resin mixture, particularly since Green discloses that suitable initiators are well-known.(Col. 15, ll. 12-16) Absent unexpected results, this is considered obvious.

Regarding claims 22 and 23, the reference discloses the fibers can be glass or carbon.(Col. 2, ll. 29-33)

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Green and Pratt as applied to claim 1 above, and further in view of Cook et al.

The references cited above do not disclose whether the prepregs are stacked individually or in groups when they are stacked on the molding surface. Cook et al. discloses the prepregs can be stacked individually or in groups on the mold surface depending on the desired overlap pattern.(Col. 5, ll. 5-9) It would have been obvious to one of ordinary skill in the art at the time the invention was made that the prepregs could be stacked individually or in groups on the mold since they are obvious alternatives in the art and particularly since Cook et al. discloses the prepregs can be stacked individually or in groups on the mold surface depending on the desired overlap pattern.(Col. 5, ll. 5-9)

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6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Green and Pratt as applied to claim 1 above, and further in view of Dickerson(U.S. Patent 4,065,340).

The references cited above do not disclose curing the resin in the absence of oxygen. It is well-known and conventional in the molding arts to vacuum form articles containing fiber reinforced resin as shown for example by Dickerson which discloses partially curing the prepregs under vacuum.(Col. 1, ll. 65-67) It would have been obvious to one of ordinary skill in the art at the time the invention was made to cure the prepregs under vacuum as shown for example by Dickerson for the well-known and conventional reasons to cure in vacuum.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Miller(U.S. Patent 3,840,985).

The references cited above do not disclose joining the layers together temporarily using a high viscosity composition. Miller discloses holding together layers in a stack using a temporary adhesive.(Col. 6, ll. 5-10) It would have been obvious to one of ordinary skill in the art at the time the invention was made to temporarily bond together the layers of the stack using an adhesive since it is well-known in the bonding arts to temporarily bond together two layers before curing as shown for example by Miller(Col. 6, ll. 5-10) Adhesives are generally considered to be high viscosity.



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8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Ikegawa et al.(U.S. Patent 6,060,124).

The references cited above do not disclose that the adjusting the viscosity by increasing the temperature of the resin. Ikegawa et al. discloses it is known to reduce the viscosity of an impregnating resin by increasing the temperature and thereby decreasing the voids within the fiber matrix.(Col. 8, ll. 30-34) It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the viscosity of the resin during impregnation by increasing the temperature since that results in better impregnation of the fibers and fewer voids as shown by Ikegawa et al.(Col. 8, ll. 30-34)

9. Claims 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spragg et al., in view of Markow et al., Green, and Pratt.

Spragg et al. discloses using bands containing thermosetting materials as run-flat elements in a tire. These bands are coated with a rubber mixture to aid in bonding to the rest of the tire.(Abstract; Col. 6, ll. 46-50) The reference discloses the bands can contain thermosetting resins but is silent as to their exact structure.(Col. 2, ll. 10-14) The reference does refer to Markow for an example of the band.(Col. 1, ll. 38-48) Markow et al. discloses the band can be a layer containing thermosetting resin and fibers.(Col. 2, ll. 47-50) It would have been obvious to one of ordinary skill in the art at the time the invention was made to

The references do not disclose the specifics of the fiber reinforced resin or how it is formed. Green discloses impregnating radiation curable and heat-curable resin into unidirectional fibers, at least partially curing the radiation curable resin, forming the prepregs into an article, and curing the heat-curable resin to form the final product.(Abstract) These prepregs are made of the same materials used in tires, namely steel.(Col. 2, ll. 29-30) ) The reference does not specifically disclose stacking the layers in a mold prior to finally curing them. Pratt discloses it is well-known and conventional to stack layers of partially cured unidirectional fiber-reinforced material in a non-planar support and consolidating them to remove voids.(Col. 5, ll. 41-50; Col. 5, ll. 66- Col. 6, ll. 7) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the band of Markow et al. in Spragg et al. since Spragg et al. discloses that Markow is the type of band the reference is intended to be used with.(Col. 1, ll. 38-48) and to form it using the method of Green since this method allows the prepreg to be cure to a formable solid state where it can be applied to a tire and to stack the layers on the support of Pratt prior to finally curing them since the device of Pratt would allow formation of the multi-layered shaped part of Green without voids which would reduce the strength of the final structure(Col. 6, ll. 2-8) particularly since Green discloses the sheets can be stacked and shaped, indicating they are formed into a nonplanar shape.(Abstract)

Markow discloses the band can be formed using multiple strips of prepreg.(Figure 3) As the rubber is intended to be cured(Col. 6, ll. 55-58), it is assumed

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to be sulfur-curable, since that is the well-known and conventional method of curing rubber.

Sheets of unidirectional fibers are considered to have the fibers substantially parallel in one plane as that is the conventional description of a sheet of unidirectional fibers.

While the claims are not restricted to polymerizing using ionizing radiation only to a specific depth, it is noted that Green discloses a variety of irradiation times, indicating that some of the sheets are only partially cured.(Col. 17, ll. 18; Col. 18, ll. 53) Since these sheets are cured to at least the amount shown in applicant's examples, one in the art would appreciate that the fibers would not buckle as applicant's do not buckle. Since the sheets are only partially cured and in partial curing some of the reactive components have no reacted, one in the art would understand that those reactive components would be capable of bonding with other reactive components in adjacent sheets, and therefore polymerization would have been limited so as to permit bonding of the sheet to another sheet.

It is noted that the final products being capable of being subjected to high mechanical stress does not require the products to be capable of surviving such stress, simply that they can be exposed to it. It does not appear to limit the process or materials in any way. While the reference does not state the final products are capable of surviving high mechanical stress, they are made in the same manner as applicant's using the same materials to form the same type of products. It would naturally flow from

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that that the final products would both be capable of surviving the same types of stresses.

While the references do not specifically state the prepregs are fitted snugly against each other and the support, one in the art would appreciate that the prepregs would be fitted snugly against each other to prevent gaps which would reduce the strength of the final product as is known in the art.

Regarding claim 26, Spragg et al. discloses the partially cured rubber and the band are fully cured in the final molding operation.(Col. 7, ll. 6-7)

10. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spragg et al., Markow et al., and Green as applied to claim 24 above, and further in view of Voss et al.

Spragg et al. discloses the fiber/resin layer is bonded to the rubber using an adhesive cement, but does not disclose the specific compound.(Col. 6, ll. 47-49) Voss et al. discloses it is well-known and conventional in the tire art to use resorcinol formaldehyde latex glue to bond rubber to synthetic fibers.(Col. 1, ll. 31-35) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use resorcinol formaldehyde latex glue to bond the band, made of resin-impregnated fibers, to the rubber of Spragg et al. since it is the conventional glue used in the art for bonding synthetic fibers to rubber.(Col. 1, ll. 31-35)

***Allowable Subject Matter***

11. Claims 12 and 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.
12. The following is a statement of reasons for the indication of allowable subject matter: regarding claim 12, the prior art of record does not teach or fairly suggest inserting a layer of the composition used to form the layers of the stack between layers of the stack and partially curing that layer using ionizing radiation. Regarding claim 13, the prior art of record does not teach or fairly suggest joining layers of the stack together by subjecting the stack to pre-molding to continue polymerization before a separate step of final molding.

***Response to Arguments***

13. Applicant's arguments filed 2/9/04 have been fully considered but they are not persuasive.

Regarding applicant's argument that Green and Pratt fail to disclose controlling polymerization so as to limit it, Green discloses the resin is only partially cured. Sheets containing partially cured resins are capable of bonding to each other since the reactive groups in one sheet can bond with the reactive groups in another since the reactive groups are still present as the sheets have not been fully cured. The definition of partially cured is that reactive sites/groups remain unreacted.

Regarding applicant's arguments that the references do not show the fibers are resistant to buckling, Green cures the prepregs for 30 to 60 seconds, within the range that applicant shows forms prepregs resistant to buckling(Pg. 20) Therefore the prepregs of Green would also be resistant to buckling.

Regarding applicant's argument that Green does not disclose the final product being capable of being subject to high mechanical stress, being capable of being subject to high mechanical stress does not limit the materials or process as most solid items are capable of being subjected to high mechanical stresses, but not all of them are capable of withstanding high mechanical stresses. Green uses the same type of materials as applicant and fully cures them as applicant does. One in the art would appreciate that since the products were made in the same way from the same materials, they would both be capable of withstanding high mechanical stresses.

Regarding applicant's argument that Green does not disclose shaping the pre-preg to a non-planar surface, the reference discloses the pre-pregs can be shaped. Since they are originally flat, any shaping would make them non-planar. While Green's only specific example discloses winding the pre-preg while partially curing it, the reference clearly discloses that pre-pregs can be partially cured, shaped and stacked, and then finally cured.(Abstract) The fact that the reference does not show an example of such does not mean it does not disclose such.

Regarding applicant's argument that Spragg et al., Markow et al., and Green do not disclose a process as in claim 1, Green and Pratt et al. discloses all the limitations of claim 1.

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### **Conclusion**


Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Barbara J. Musser** whose telephone number is **(571) 272-1222**. The examiner can normally be reached on Monday-Thursday; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571)-272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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